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Downloading Problems?

by Kay Worrell[1]
Director, Survey Research Center
The Conference Board, New York

In the past two years, with the trend toward decentralization of many computer services and with the spread of microcomputers, new applications and new problems have arisen in research organizations. "Downloading," or moving files from a mainframe computer to microcomputer, offers some new opportunities and some solutions to old problems. But as with other solutions, new problems are also presented.

There are four areas in which problems may occur:

- The mainframe "source" of the data

- The data itself — its form

- The communications package and modem — the vehicle(s) with which the data are to be moved

- The receiver — the software (or system) into which the data are to be stored.

[1]Presented at IASSIST Meeting 1985, Amsterdam

In discussing some of the problems which might occur in these four areas, I will use two specific downloading applications attempted to solve Conference Board problems. One of these involved the downloading of numeric data from our own mainframe computer, a Burroughs; the other was a test downloading of mixed numeric and text data from an external on-line database. In both cases we were downloading into an IBM PC-XT.

As background, I should say something about the Conference Board and our research. The Conference Board is a not-for-profit business and economics research group, based in New York and with offices in Brussels. The Conference Board of Canada is headquartered in Ottawa. We are supported primarily by subscription income from Associate members and by conference fees.

My department, the Survey Research Center, processes questionnaires for researchers surveying business practices and economic trends, and assists research staff with computer systems and software. It is important to note that for most of our survey data, the "case" is the corporation or company, and the "background variables," or demographics, are company traits such as sales, assets, number of employees and type of industry.

Our specific applications

The first and simplest application was downloading coded numeric data from a dataset we had developed in our mainframe computer. The data was set up in 80-column records to be used with SPSS, as is most of the data we process from our questionnaires. The purpose was to provide research staff an opportunity to work on the data interactively in a PC statistical package, and to experiment with PC spreadsheet

and database management packages. The latter would offer more flexibility in using nonnumeric data such as names of companies, titles of indivuduals, and responses to open-ended questions. After downloading, we would add this information to the coded numeric files in the micro.

The second application was to try to download company information from an external online database as a possible source of background information for our questionnaire data. In the past this information was requested on the questionnaire, and checked upon receipt, or was added to the questionnaire after it was returned from printed sources such as the Standard & Poor's Directory of Corporations or Fortune magazine's annual List of 500 Largest U.S. Corporations. The information was then key-entered with the rest of the questionnaire data. Sometimes the information was encoded on the questionnaire label, prior to mailing, from our own mainframe computer list, where much of this information is also kept and updated regularly. Again, it would be re-keyentered into the specific dataset when the questionnaires were returned.

We decided to try to download company information from the Disclosure II database, available online through DIALOG. We wanted to download company names, sales, number of employees, and primary SIC (Standard Industrial Classification) number, used to indicate industry group. We were then going to explore ways to link this information with that in our data files, or organize it in such a way that it could be easily referenced by clerks in an off-line mode. The information in the Disclosure II database is derived from the forms that publicly-held companies in the U.S. are required to file with the Securities and Exchange Commission. Disclosure has an exclusive contract with the SEC to computerize this data, so that it is the most complete, authoritative, and up-to-date source available. I should note that this downloading was purely exploratory, and that

permission would be arranged before the Conference Board would implement use of such an external source.

Thus our second application might offer solutions to several problems, by allowing us update our own mainframe list with the most current and reliable information, match this information with questionnaire data, and avoid considerable clerical work and redundant keyentry.

Interface considerations in downloading

Beginning in the mainframe dataset, the size of the file should be one of your first considerations. This will be influenced by the number of records as well as by the volume or size of each record. The critical question at this point is: Will the file fit on a floppy disk?

Format of the dataset is another important concern. Is it fixed field? SDF (standard delimited format) convertible? Is the data in column format? If so, is it SDF or DIF convertible? Is it numeric, alpha, or mixed? Are there multiple "lines" or "records (cards)" per case? Are there variable length fields or variable length records (a different number of fields possible on each)?

What are the host system characteristics? Are there line numbers? Is numbering an option? How long is each line, or record? What type of end-of-line or end-of-record character is used? Can the host system transmit anything besides ASCII files?

What is the configuration of the communications hardward? Full or half duplex, synchronous or asynchronous line; speed of communication — baud rate? What communications package will be used? What will it do for you? Can you

move system files or just ASCII files? Will the receiving unit be a hard disk or diskette? How much space is available? What is the method of transfer, or "protocol?"

Finally, after the data is downloaded to the PC or microcomputer, there are the following questions. Can you load the information directly into the package you wish to use it with? Will it be desirable to load it into a word processing package? As an intermediary, for reformatting? For word processing uses? If it is to be used in a database management package or a spreadsheet package, will you wish to add additional data? To merge with other files?

The downloading

We used LinkIT to communicate between the two systems, and most often used KeepIT, a database management package, to receive the files. Both are produced by ITSoftware of Princeton, NJ and distributed by Martin Marietta Data Systems. The main advantage of KeepIT is its interfacing capabilities, allowing it to receive and reformat data and generate output directly in SDF, DIF or other ASCII format.

The steps to download are the same for all applications,and are:

- Sign into the communication package.

- Call up the host computer in which the "source" dataset is stored. (Set or reset communications parameters, if necessary. Most often these can be saved in the communications package used.)

- Sign into host computer and call up dataset. DO NOT ISSUE A "LIST" OR

"DISPLAY" COMMAND YET. You may want to check on the size of your dataset before downloading.

- Indicate to communications package that you wish to "receive" a file. this will probably be done with a function key. (LinkIT leads the user to such an option with a menu.)

- The package will ask you to name the file. This may be done using normal naming conventions, including designating the disk drive address. Be sure there is sufficient space available for the file.

- Return to host system and issue a "LIST" or "DISPLAY" command. The "listing" should then be "received" by the communications package. Note: If the host system allows an option of listing "unnumbered," that is, without line numbers, use this option. Otherwise you will want to remove the line numbers after the file is downloaded.

- When the listing is completed, the downloading will be completed. Most often you will see this indicated by the end of a count of characters received appearing on the screen.

- Sign off the host system. Then exit the communications package.

- The downloaded file will be stored on your hard disk or diskette, with the name you supplied in step 5.

- You may then load the file into the package of your choice. It may be called directly into most word procesing packages. If you use a database management package such as KeepIT or dBase III, you must first define the file parameters, including all fields and the length and type of each.

The first problem we encountered downloading data files from our mainframe was that of the line numbers, mentioned above. This can be avoided by using an "unnumbered" option. Another, related problem was some unnecessary information repeated on each "card" of a case or observation — questionnaire identification number and "card" number. this information took up the first nine columns on each "card" or line, and was easily removed using a word processing package. Or, loading the whole file into a database management package, that information could be defined as "dummy" variables or fields, to be omitted later.

We have tried to keep the size of data files downloaded rather small — less than three "cards" per case and only a few hundred cases. Larger files are not very efficiently processed in a PC. Even so, downloading can be time-consuming at normal baud rates of 300 or 1200. To speed up the communicating of larger files, our EDP department provided us with a special line to transmit data to the PC at 9600 baud. This required changing the modem from Hayes to "direct" and some changing of the plugs, besides changing the baud rate setting.

Also, as noted above, it is important to estimate the size of the file to be received and to be sure that the disk on which it will be received has sufficient space. If this is not the case, you may lose much of the data you tried to download, and waste considerable time.

As our data was in 80-column records and was already in fixed-field format, we expected no problems defining the fields to the database management packages. Using KeepIT's menu, we just "READ DATA." We discovered, however, that KeepIT requires each record to have 80 columns, and no less. Some of our records were shorter than 80 columns, and CANDE, the Burroughs operating system command-and-edit language did not fill those records in with anything recognizable by KeepIT. So our staff had to place a character

in the 80th column of each record before downloading into KeepIT. This was done with a "replace" command in CANDE, but it meant we could only use 79 columns for data.

We have used KeepIT as an intermediary, to format files for dBase, Lotus 1-2-3 and WordStar's MailMerge. In dBase, after defining the file parameters, we can use "APPEND". If the file contains addresses, we can use either KeepIT or dBase to create a MailMerge input file. We can produce a DIF output file with KeepIT, using SPREADSHEET INTERFACE, and then "Import" this file into Lotus 1-2-3. Or we can use the dBase-Lotus interface for this purpose.

To add data to any of thse files, we need only create the additional fields, copy existing data in, then edit the file to add the new data. Or we might create parallel files with a linking ID number for the new data, then merge the files.

On moving data into statistical software packages, we found some common good points and bad points. In their favor is the fact that virtually all PC statistical packages seem capable of accepting ASCII data files. We have experimented with SPSS-PC, StatPac and StatIT. Some time can be saved if SPSS is to be used on the PC, as much of the labelling used for SPSS in the mainframe can be downloaded and adapted for use in SPSS-PC. Of course if you are using an IBM mainframe with Kermit, downloading will be even more convenient.

A disadvantage is that PC statistical packages have a smaller capacity, as would be expected, than mainframe packages. Thus only partial files could be used. Another problem encountered was that StatPac will not read multiple-line or multiple-card files. The data must be in a continuous stream ending with a carriage return after each record. A record may not exceed 255 characters. A utility file, which comes with StatPac, must be used to concatenate 80-coumn records to form a StatPac-readable

record.

Trying to download data from an outside system created considerably more problems. As was noted at the beginning, this was an experimental application. Again using LinkIT, we signed into DIALOG, and then into Disclosure II. We discovered there were three basic forms in which data could be presented from Disclosure. The first did not include the variables we wished to see — sales, assets, number of employees and SIC number. The second, the Corporate Resume, contained considerably more information than we wished — about two full screens of data for each company. The third contained much, much more — whole company records, including text from annual reports. We decided to try to download the Corporate Resume for a small number of companies, just to see how long it would take. Selecting only companies with upwards of $40 billion in net sales, we narrowed the search to 17 companies. We then downloaded these companies. Even at 1200 baud, it took nearly 10 minutes to complete this download.

Based on the time it took, and especially considering the line charges for DIALOG and Disclosure, we determined that this would not be an efficient updating mechanism. Further inquiries revealed that DIALOG will, under certain circumstances, download large files for the user onto a 9-track tape, to user specifications. We also found that we could purchase the entire Disclosure database on 9-track tape from Disclosure, including updates. (And since this paper was presented, I have received promotional information on MicroScan, a software product from DISCLOSURE to assist the PC user in searching and downloading from that database.)

Other problems that became evident, but which we did not seek to solve after the downloading, were the very large size and variable length of each record.

A positive factor we discovered about Disclosure was that, in addition to virtually all the company data that is publicly available for corporations, each record contained the D & B identification number, as well as that used by Standard & Poors' and others. Ticker symbols used on the stock exchanges were also included. Thus data from this database could easily be merged with data from any other, where one of these common numbers were in use.

On the basis of this experience, we have decided to consider purchase of Disclosure on tape to update our mainframe files. We have also decided to use one or more of the common identification numbers listed in Disclosure as an identifier on all future datasets we plan.

I should add that, although I will not discuss it at length here, we have also found it convenient to enter data into the PC on occasion, and upload it to the mainframe. We have done this using Lotus, to allow us to compute new variables during the data entry step. It should be noted that for large datasets the reaction time for Lotus becomes quite slow. We then uploaded one "card" of data and merged it with nine other "cards" that had been keypunched in the traditional way. We have also entered some questionnaire data directly into a "screen" set up in dBase III, and uploaded some of this information for use with SPSS. The problem we had to deal with in this type of transfer was transmitting a pause after each record, or "line," to allow the system time to assign a line number for each.

It is expected, of course, that future developments in specific software packages will include interface enhancements. These, along with improvements in communications hardware and software, will greatly facilitate our ability to move data among packages and systems.■

LinkIT -- screen one

```
LinkIT 1.2    (c) Copyright 1983 VM Personal Computing   OFFLINE
                  (c) Copyright 1983 IT Software


              Your PC  ID is: THE CONFERENCE BOARD INC.

              F1 = Call a Computer Named CONFBD

              F2 = Answer a Call from A PC

              F3 = Review the Directory of Computers

              F4 = Set Personal Computer Options

              F6 = Edit a File

              F7 = Edit a File

              F8 = Run a Program

              F9 = Stop Printing


              Esc = Exit      F10 = HELP
```

Directory of Computers

Name	Telephone Number	Speed	Type	Notes and Comments
A PC		300	PC	IBM PC using LinkIT
COMPSERV		300	Host	COMPUSERV service
CONF BD 83,456		1200	Host	THE IN-HOUSE BURROUGHS SYS
DOWJONES		300	Host	
SOURCE		300	Host	SOURCE timesharing service
TSO		300	Host	Direct call to a TSO system
TYMSHARE		300	Host	TYMSHARE or equivalent
UNATTEND		300	PC	Leaves LinkIT Unattended
VM		300	Host	Direct call to a VM system

Use PgDn and PgUp to scroll the Directory

F1 = Call Name at Cursor   F2 = Answer Name at Cursor

F3 = Add a New Name in   F4 = Review Connect Options
     Directory By Copying   for Name at Cursor
     Entry at Cursor

Esc = Quit   F10 = HELP

LinkIT -- screen three

```
LinkIT 1.2      Your PC ID is: The Conference Board    ONLINE

               F1 = Return to Terminal Screen

          Alt F1 = Redial or Reanswer the Telephone

          Alt F2 = Hang up and Return to Main Offline Menu

               F3 = Send Files to Another Computer

               F4 = Receive Files to Your PC

               F5 = Set Current Connect Options

               F6 = Edit a File

               F7 = Print Files
               F8 = Run a Program

               F9 = Stop Printer or File Transfer

                      F10 = HELP
```

KeepIT -- screen one

```
RECORDS: 0            KeepIT - MAIN MENU           FILE: C:DAY


         DATA ENTRY                  FILE DEFINITION

    ED - ENTER DATA           DF - DEFINE THE FILE
    PD - POST DATA            DC - DEFINE CONSTRAINTS
    RD - READ DATA            DI - DEFINE INDEXES

         DATA MAINTENANCE              INTERFACES

    CD - CHANGE DATA          CI - CalcIT INTERFACE
    VD - VIEW DATA            GI - GRAPHICS INTERFACE
    CF - COMPUTE/FILL DATA    SI - SPREAD SHEET INTERFACE
                             ML - MAIL LIST INTERFACE
         REPORTS             FI - FORMS INTERFACE
                             ST - STATISTICS INTERFACE
    PR - PRINT A REPORT       WO - WRITE OUTPUT FILE
    TR - TABULATION REPORT    SH - ShowIT INTERFACE
    SR - SUMMARY REPORT
    WI - MOVE REPORTS TO WriIT

         QUIT                      HOUSEKEEPING

    QF - QUIT FILE            DO - DIRECT PRINTER OUTPUT
    QD - QUIT TO DOS          FM - FILE MANAGEMENT
    QA - QUIT TO ASKIT        MC - MAINTAIN CATALOGUES

         PLEASE SELECT AN OPTION:
```

KeepIT -- screen two

```
FIELDS: 0              DEFINE THE FILE              FILE: C:DAY

              A - CREATE FIELDS FOR A NEW FILE
              B - INSERT A FIELD
              C - DESIGN/EDIT FIELDS ON SCREEN
              D - DELETE A FIELD
              E - DISPLAY A FIELD
              F - SCAN THE FIELDS AND MAKE CHANGES
              G - DISPLAY THE DATA ENTRY SCREEN
              H - PRINT THE FIELD SPECIFICATIONS
              I - PRINT THE DATA ENTRY SCREEN
              J - SET FILE PARAMETERS
              M - RETURN TO MAIN MENU

              PLEASE SELECT AN OPTION:
```

KeepIT -- screen three

```
FIELDS: 1            DEFINE THE FILE          FILE: C:DAY


              SPECIFICATIONS FOR FIELD:   1


   (1)    PROMPT   1 -            (6)     TYPE OF FIELD
   (2)    NAME                    (7)     MAX LENGTHT
   (3)    page,pageend               (8)      LOWER LIMIT
   (4)    ROW                     (9)     UPPER LIMIT
   (5)    COLUMN                  (10)    INPUT SPEC

                                  (11)    FORMAT

   (12)    DEFAULT/FORMULA
```

```
    RECORDS: 0           MAIL LIST INTERFACE        FILE: C:DAY

                    A - WritIT/MULTIMATE
                    B - WORDSTAF/MAILMERGE
                    C - EASYWRITER/EASYFILER
                    D - PEACHTEXT
                    E - WORDPLUS-PC
                    F - WORDPERFECT
                    G - EDIS+WORDIX
                    H - SPELLBINDER/EAGLEWRITER
                    I - QUOTE MARKS/COMMA DELIMITED
                    J - FIXED LENGTH

                    PLEASE SELECT AN OPTION:
```

Getting a Turnout: The Plight of the Organizer

Experiences in promoting a computer conference[1]

by Chuck Humphrey

> The biggest problem seems to be just building up the momentum to get people started. I started the CIPS conference about 6 months ago, signing up about 20 people. Now there are more like 30 signed up but only about 10 who use it and less than that who contribute much. However, that seems to be a fact of computer conference in general.[2]

This quotation expresses some of the frustration that computer conference organizers face as they attempt to initiate and nurture a conference. The existence of a computer conference hinges upon the level of involvement of its members; and yet, achieving an active membership appears

to be one of the most difficult tasks confronting the conference organizer.

Jon Nightingale's experience in beginning a national computer conference for the executive of the Canadian Information Processing Society (CIPS) is similar to my experience in organizing DataLink, a national computer conference for Canadian data libraries and archives. Out of a group of about thirty members, roughly only ten participants can be described as being active. Some of the factors which affect small group participation, in general, will undoubtedly apply to computer conferences of this size. However, unique barriers to participation do exist for computer conferences and the discussion below addresses some of these.

Types of computer conferences

The level of activity among computer conferences seems to vary according to the task of the conference and its membership restrictions. Using the dimensions of task orientation and scope of membership, a computer conference can be characterized as being one of four types. Examples of these are shown in Figure 1. *(Ed. note: figures and tables are gathered together at end of article)*

Having participated in conferences fitting each of these classifications, I have generally found the General–Task/Open–Membership conferences to be the most active, while the Specific–Task/Closed–Membership groups have tended to have the most sporadic participation.[3] The following discussion describes

[3] The "level of participation" or "activity" of a conference can be defined in a number of ways. Below, "activity" is measured in terms of connect time. Yet another way to described the level of participation in a conference is to identify active and passive participants. This too is mentioned below.

a case study of this latter type.

DataLink: a case study

During the 1983 Learned Societies in Vancouver, a one-day workshop was sponsored jointly by the Federal Department of Communications and the Machine Readable Division of the Public Archives.[4] This meeting brought together a number of the principals involved in the funding, generation, analysis and preservation of machine readable data files (MRDF). Among the participants were spokesmen for granting agencies, data producers, researchers, and data depositories.

Out of this meeting two issues seemed to converge. First, the need for a set of guidelines which advise in the preparation and deposit of MRDF was expressed by all participants. Secondly, a call was made to form an ongoing computer conference to encourage discussion among the staff of Canadian data libraries and archives.[5] At that time, no Canadian forum existed for professionals in this field.

Encouraged by a supportive response in Vancouver, a proposal was submitted to the SSHRCC requesting support for a computer conference which would exist primarily to draft a set of MRDF standards.[6] Therefore, the

orientation of the conference was clearly defined from the beginning as being task specific.

Membership was restricted to practitioners who we knew to work with MRDF on a regular basis. In April 1984, twenty-seven invitations were mailed; twenty replied indicating a willingness to participate. Eleven additional invitations were sent in June of which seven of these agreed to participate.[7] Membership by nature was closed. Thus, DataLink clearly fits the task-specific/closed-membership conference type in Figure 1.

Special problems: group maintenance

One concept used to analyze group behavior is the task-maintenance dimension.[8] Task processes deal with the group accomplishing its organizational purpose, while maintenance processes function to hold the group together and to secure the members' commitment to the group's task.

Organizing a computer conference where most of the members do not know each other and where the members are spread across a continent poses special maintenance problems. How will the level of participation in a computer conference be affected by the low level of interpersonal contact among the members? How does an organizer conduct team building exercises under these conditions?

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[4]A summary of the session, "Towards a Canadian Electronic Heritage: The Vancouver 6 June Consultation," is available from Harold Naugler, Director, Machine Readable Archives, Public Archives Canada.

[5]L. Ruus, W. Watkins and C. Humphrey, "A Proposal for a Computer Conference for Managers of Canadian Data Libraries and Archives," (Vancouver, mimeo), 1983.

[6]C. Humphrey and W. Watkins, "A Funding Request to Implement the 'Proposal for a Computer Conference for Managers of Canadian Data Libraries and Archives'," August 1983.

[7]One more person joined in late August bringing the total membership to 29 including the organizer.

[8]The task-maintenance dimension is one aspect of L. Richard Hoffman's hierarchical model of group behavior. See L. Richard Hoffman, "Improving the Problem-Solving Process in Managerial Groups," *Improving Group Decision Making in Organizations* (Academic Press, 1982), p. 95-125.

Membership maintenance: an ad hoc experiment

The question about how the level of participation in the computer conference would be affected by members not seeing each other first-hand was examined in an ad hoc experiment. The proposed date for starting DataLink was chosen to coincide with the 1984 annual meeting of the International Association for Social Sciences Information Service and Technology (IASSIST), which serves as an international forum for producers, users and archivists of machine readable data. Since the IASSIST conference was held in Ottawa in May, it was seen as an ideal oppotunity to gather the members of DataLink in an in-person workshop. Thus, participants could attend a major conferences in their professional field and also meet to initiate DataLink.

While not all of the original twenty members of DataLink were also able to attend the IASSIST workshop, eleven members did meet. Since two groups resulted from the division between those who attended and those who did not attend, a quasi-experimental design presented itself for group comparisons (see Table 1,). Thus the in-person workshop at the IASSIST conference functioned as an experimental condition, while the nine members not attending the workshop formed a control group. Those who were invited to join DataLink after the meeting in Ottawa formed yet a second control group.

The obvious weakness in this ad hoc design is the non-random assignment of paricipants to the experimental and control groups. Any differences in activity level between these groups could be attributed to uncontrolled factors separating these members who attended the workshop from those who did not attend. One major uncontrolled factor was the amount of a priori commitment by members to DataLink. In fact, an argument can be made that the cost of time and travel to Ottawa alone

indicate a relatively strong commitment by the experimental group.

The dependent variable measuring the activity level of participants is their average monthly connect time with DataLink. Since one group of participants was not invited until June, average monthly connect time in minutes was used rather than total minutes. These calculations were based through December 1984. As mentioned in an earlier footnote, this is only one measure of participation. Using total connect time combines both between the two control groups, although these figures still remain about half the number of average monthly minutes spent by members of the experimental group.

The distribution of connect time for each group is skewed as shown in Figure 2. The experimental group has the widest midspread and the only outlier of the three distributions. By transforming the dependent variable to the natural log scale, the distributions become more symmetric (see Figure 3). A prominent feature of Figure 3 is the wide degree of variability in the experimental group. While this group has the highest median, it also has the widest spread of connect times. The first control group however has the narrowest midspread, although it is skewed toward the smaller connect times.

Standard non-parametric tests of the medians and ranks however reveal no statistically significant differences among the three groups (see Table 3). The size of each group is small and two groups have wide midspreads; therefore these test results are not particularly surprising. Nevertheless, a trend is evident in the summary figures of Table 3 for the counts of those above, below and tied with the overall media. Two-thirds of the experimental group are above the overall median, while only 30 and 33 per cent of the first and second control groups, respectively, are above this figure.

The results are inconclusive whether attending the in-person meeting actually increased the level of participation by these members. While a larger proportion of the experimental group had connect times greater than the overall median, the variability of connect times was also the greatest in this group. There were some members who attended the in-person meeting who subseqently participated minimally in DataLink. In addition, the non-random assignment of members to the three groups seriously prevents attributing an effect to the in-person meeting. A priori commitment may be a more important explanatory variable.

Other barriers to participation

While other obstacles to participation were not examined like the above question about the importance of personal contact among the members, several barriers to participation have been identified. The discussion below describes some of these obstacles and offers suggestions for minimizing their impact.

Start-up barriers

One of the most difficult tasks confronting an organizer is getting each member to use the conferencing system for the first time. Short of sitting down with each member and insisting that they log on the system in your presence, that is, coercion, the incentives for motivating people to begin using the conference are difficult to define. With DataLink, the invitation letter clearly expressed the commitment that was expected of them:

"What will be your commitment":

First, you will be asked to join the computer conference as an active participant. This means that you will be expected to check the conference activities on at least a weekly basis and to contribute to the discussions within the conference.
Secondly, you are encouraged to attend the 1984 IASSIST conference to be held in Ottawa from 15 - 17 May. During these meetings a special gathering will be held to initiate the computer conference and to train participants in the use of the conferencing software."

Nevertheless, people are volunteering their time and simply making expectations clear does not necessarily close the gap between intention and action.

Therefore, one of the primary concerns for the organizer is to increase the likelihood that once they do log on the system, their first conferencing encounter will be a positive experience. It is difficult enough getting a novice even to try a conferencing system, but all the more difficult to keep that person on the system if their first conferencing experience is bad.

There are a number of precautions that can be taken to minimize bad first attempts. Probably the most preventive measure that can be taken is for the organizer to be present when members are first joining the conference, although this is far too often impractical. With DataLink, we were able to get most of those who attended the workshop in Ottawa to join the conference with a consultant present.

Another precautionary step is to register members in the conferencing system before hand, including directory files for electronic mail systems. Since conference registration occurs only the first time the system is used, pre-registering participants removes a non-recurring feature. Therefore, expectations

about how the system behaves upon entering the program are not different from the first time to the next. Also, registration can require a fair amount of explanation which can be avoided entirely.

Forum, the host system under which DataLink exists, places the user in a general conference mode rather than in a specific conference. However, it is much better to place users into a specific conference that to leave them in general mode. The user simply faces less ambiguity as to where they are located during their conferencing session. The members of DataLink all had a file initialized prior to their first conferencing session which placed them automatically into DataLink.

Documentation: more than just a cliche

While emphasizing the importance of documentation has become a computing industry cliche, printed documentation is essential for computer conference members who are at distances greater than a local phone call to a consultant. The documentation however must be useful. Most computer systems are not short on documentation, rather they are short on useful documentation. Poorly written documentation unfortunately can be as big an obstacle to the user as too little documentation.

Two types of documents were used with DataLink: a tutorial guide and a reference manual. The latter document already existed;[9] however, the tutorial guide had to be written.[10]

The style which was followed applies some of the ideas from script theory in social psychology.[11] In its simplest form, this style consists of providing a script that details how to act. Documentation written in this manner requires less cognitive attention by the user than concept-oriented documentation, that is, there is a smaller processing load on the reader. Manipulating and understanding concepts become secondary to getting the user simply to match their interaction with the system to a script.

Script-like documentation should also include many examples about how a conferencing session should appear. Again, the focus is toward getting the user to match their experience to the script. I have found many users of statistical packages to employ this type of heuristic when doing data analysis. They will locate an example which is close to their problem, replicate the setup of the example and then fine-tune the example to their problem. Applying this style to the DataLink tutorial seems to have been effective since several of the participants have made favorable comments about the document.

Surviving the low points: summer's heat can cool the conference

The months of May and June are not particularly wise choices for beginning a computer conference. If you manage to achieve any momentum during these two months, you are guaranteed to lose this pace in July or August. Figure 5 shows the cumulative number

[9]Alan Ballard and Jon Nightingale, "A Computer Conferencing Program," (University of British Columbia, mimeo), April 1984.
[10]Charles Humphrey, "DataLink Forum: An Introduction to the DataLink Computer Conference" (University of Alberta, mimeo), May 1984.

[11]A concise summary of script theory is found in Robert Abelson, "Script Processing in Attitude Formation and Decision Making" in J.S. Carroll and J.W. Payne, eds., *Cognition and Social Behavior* (New York: John Wiley), 1976.

of lines entered in discussions and responses from May to December. A summer plateau reveals that few lines of text were entered during that period. Figure 6, which displays the total number of discussions and responses for each month, shows a similar relationship. During the month of August, not one entry was made.

In an effort to restart activity in September, all previous conference entries were listed and formatted with a text-processor to produce a newsletter, The DataLink Report. The participants were each mailed a copy of this newsletter along with a cover letter encouraging them to participate in DataLink. Several members commented that they liked receiving the newsletter and some said that they preferred reading the items in print rather than on-line. Consequently, two newsletters were mailed in October and one each in November and December. Only the most recent contributions were reported in each issue of the newsletter.

One further item mailed with each newsletter was a listing of all participants and the date of their last conferencing session. Serving as a crude report card, it was intended to apply a bit of social pressure to check in with DataLink on a more frequent basis. A couple of the members mentioned some slight embarrassment by their placement on the listing, although its total impact seemed negligible. Guilt does not always motivate.

Reviewing conventional beliefs

In the original proposal for DataLink, a number of reasons were given which postulated the usefulness of a computer conference in bringing together the staff of data libraries and

archives.[12] Most of these arguments were based upon beliefs about how computer conferences should work. In light of the experiences with DataLink over the past eight months, some of these propositions need updating.

The original arguments about the medium fit into three categories: gained efficiencies through the medium, democratic aspects about the medium, and the technological compatibility of the medium with this group. The propositions within each of these categories are discussed below.

The cost advantage mentioned in Figure 7 of getting together a group of people from across the continent are clearly held by this medium. An economy, return airfare from Montreal to Edmonton obtained through a seat sale costs around \$350.00. Compare this cost to the conferencing expenses incurred by one of our more active participants from Montreal. In November, his conference usage cost \$11.74, which covered one hour and 43 minutes of connect time during which he entered 173 lines of text and read approximately 500 lines of text. The ratio of this specific monthly usage charge to the cost of the special airfare would pay for 51 hours and 11 minutes of computer conferencing or approximately 30 months of usage similar to his November level of activity.[13]

The second point in Figure 7 argues that the asynchronous nature allows more individual

[12]L. Ruus, W. Watkins and C. Humphrey, "A Proposal for a Computer Conference for Managers of Canadian Data Libraries and Archives," (Vancouver, mimeo), 1983, pp. 3-4.
[13]Of course this assumes that computing charges will remain constant over time. This in fact has not been the case. More recently, time-sharing costs have been dropping while telecommunication charges have been slight rising. However, new competition among networks is appearing on the horizon and then telecommunication charges may even begin to drop.

freedom for choosing when to participate in group's activity. Unfortunately, the asynchronous aspect of computer conferencing can lead to non-synchronous behavior! Rather than using the flexibility of the medium to schedule a convenient time for conferencing, the person simply may not participate at any time. While in-person meeting imposes a time and place to meet, a computer conference relies on each member to establish for themselves a time to participate. Such self-discipline has been shown by only a few participants in DataLink. Table 4 shows that over half of the members do not log on the system each month, while only around 25 per cent seem to participate on a regular basis.

The fourth and fifth points in Figure 7 deal with the computer conference maintaining a permanent record of its transactions and the slowness of getting out traditional newsletters, respectively. It was noted above that copies of the discussions in DataLink were printed as newsletters. In fact, several of the members indicated that they wanted to receive the printed version of the conference. It may be that rather than replacing the traditional newsletter, the computer conference will function as a means of producing newsletters slightly faster.

The openness created by a computer conference, as summarized in the list of democratic aspects of the medium in Figure 8 , does not however necessarily lead to a wider discussion of issues. A couple of the members have mentioned that they have felt insufficiently knowledgeable to comment on the material in DataLink. Conseqently, they have not entered into discussions; but a worse consequence has been that they do not introduce any new topics which they have the confidence to discuss. Thus the scope of the discussions within the conference is narrowed by this implicit norm to say nothing.

Furthermore, providing the opportunity to comment does not necessarily lead to meaningful contributions. The norm of keeping

silent for fear of saying something wrong has an opposing counterpart: the habitual commentator. They indiscriminately enter a comment on any and all discussions. This has not been a problem in DataLink. However in some conferences where this has happened, organizers have been asked to warn the habitual commentator to refrain from chattering on-line or to face possible expulsion from the conference.

The technological compatibility arguments in Figure 9 unfortunately fail to acknowledge the complexity introduced by the maze of computing equipment that is brought to bear with a networked conference and the accessibility of these machines to conference members. Some of the participants have reported that terminals are not conveniently available to them at work. They complain about having to leave their desk and immediate work environment to use a terminal in a public setting. Members who are in this situation are infrequent participants. Others have reported problems with communication software on their personal computers. On separate occasions, two have been stymied by full-duplex settings which have prevented them from seeing what they were typing.

Others have noted that they would rather prepare their entries on their own system and then transfer the text to the conference. This is easily possible for some where host to host connections exist. For example, file transfer is possible between the University of British Columbia's central system and the University of Alberta's mainframe, where DataLink resides. A couple of members prepare their entries on IBM PCs and then use microcomputer communication software to upload files and to capture and download text in return. However, the majority of the members do not have this flexibility and are required for the most part to communicate at the level of an ordinary teletype.

Three other complaints have arisen about computing facilities. First, the system at the University of Alberta is not available to users from 2:00 to 8:00 am mst. This prevents participants in the Eastern Time zone from connecting with the conference until 10:00 am at the earliest their time (although they may use the system until 4:00 am their time). The second complaint is also related to convenient connect times. Datapac, the network connection to the University of Alberta's system, has been intolerably slow during peak work hours. Some users report that the best response time occurs after 4:00 pm The third complaint has occurred about the response time on the University of Alberta's mainframe. This normally has not been a problem; but there were about three weeks during the end of the 1984 Fall Semester when the system's response time was diminished during work hours. Peak loads at that time would have been near 600 simultaneous terminal users on the system. All three factors tend to narrow the choice of times when participants can connect with DataLink. Thus the asynchronous aspect of the medium becomes secondarily controlled by the time constraints placed by the network and host system.

number of maintenance tasks must be done to keep the group functioning.

The trials and tribulations of being a conference organizer can be depressing at times. Where does an organizer go for counselling and encouragement? To a computer conference for organizers, of course! Two conferences along this line have been particularly helpful: CNFR:ORGANIZER and CRLT:ORGANIZER.[15] The membership of these two conferences consists of a number of experienced conference organizers who have been very supportive of other organizers in their struggles to keep conferences functioning. ■

Closing comment: the load on the organizer

The potpourri of experiences and suggestions discussed above point toward the need for an active conference organizer with a task-specific/closed-membership conference. Not only does the organizer of this type of conference have to care for the content of the discussions within the conference,[14] but a

---

[14] Caring for the text-base of the computer conference generally consists of editing lines that were mangled when entered, converting entries which are all in upper case to mixed case, correcting typographic errors, and maintaining the keyword or index system for the entries.

[15] The host conferencing system for both is Confer II. The former is located on Wayne State University's MTS system, while the latter is on the central University of Michigan system.

Getting a Turnout.....figures

<div align="center">

Figure 1

Examples of Computer Conferences by Task Orientation
and Membership Recruitment

</div>

TASK ORIENTATION	MEMBERSHIP RECRUITMENT	
	Open	Closed
Specific	Task Force or Commission	Working Committee (e.g., DataLink*)
General	Expanded Bulletin Board (e.g., CRLT:MICROS¤)	Planning Group (e.g., MTS:FORUM¤)

* DataLink is a conference within the Forum system at the University of Alberta.
¤ CRLT:MICROS and MTS:FORUM are conferences using CONFER II, a product of Advertel Communication Systems, at the University of Michigan.

<div align="center">

Figure 2

Multiple Sample Comparisons of the Average
Monthly Minutes Using DataLink

</div>

```
 1=Workshop      2=Non-Workshop      3=Non-Workshop/Post-Invite


                --------------
         1  -I       +      I-----                        *
                --------------

                ----
         2  --I  +I---
                ----

                --------
         3   I+      I------
                --------

            +---------+---------+---------+---------+--


         ONE HORIZONTAL SPACE = 5 MINUTES
         FIRST TICK AT 0.0
```
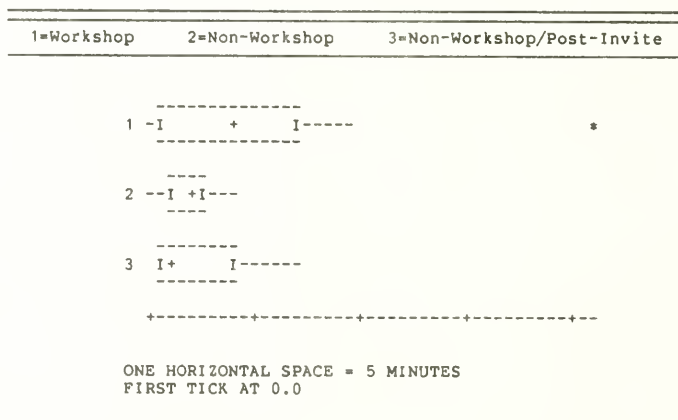
Figure 3

Multiple Sample Comparisons of the Average Monthly
Minutes (LOG) Using DataLink

```
    1=Workshop      2=Non-Workshop      3=Non-Workshop/Post-Invite


                            --------------------
    1 --------------------I              +    I-----------
                            --------------------

                               ----------
    2              ---------I      + I----
                               ----------

                            ------------------
    3                   --I     +           I-----
                            ------------------

        -------+---------+---------+---------+---------+---

    ONE HORIZONTAL SPACE = 0.10 LOG MINUTES
    FIRST TICK AT       1.000
```
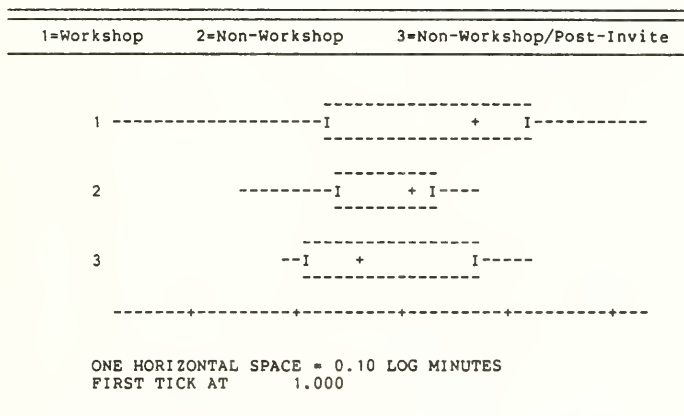
Figure 4

Some DO's and DON'Ts in the Start-Up Stage

¤   Do Help the New User Log On the First Time If Possible.

¤   Do Register Participants Ahead of Time.

¤   Don't Require the New User to Learn a Feature that
    They'll Only Use Once, Such as Registration Steps.

¤   Do Present the System in the Way that It'll Respond
    Time After Time, i.e., Maintain Consistency.

¤   Don't Leave Users Guessing Where They Are in the
    Conferencing system.

¤   Do Provide Script-Level Tutorial Documentation.

Figure 5

The Cumulative Number of Lines Entered in
Discussions and Responses in DataLink,
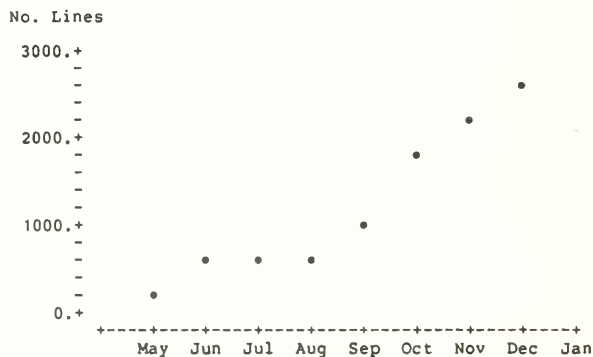May - December, 1984

```
No. Lines

3000.+
     -
     -                                              •
     -
     -                                       •
2000.+
     -
     -                               •
     -
1000.+
     -
     -              •     •     •
     -
     -        •
  0.+
     +----+----+----+----+----+----+----+----+----+
     May  Jun  Jul  Aug  Sep  Oct  Nov  Dec  Jan
```

Figure 6

The Monthly Number of Discussions and Responses
Entered In DataLink, May - December, 1984

	New Discussions		Responses

```
              New Discussions          |       Responses
                                        |
                  [     May ]  May | [     ]
                         [ ]  Jun | [                        ]
                     [    ]  Jul | [               ]
                            Aug |
                     [   ]  Sep | [           ]
            [          ]  Oct | [     ]
                    [  ]  Nov | [            ]
                    [  ]  Dec | [     ]
                                        |
    +----+----+----+----+     +--------+--------+--------+
   12    9    6    3    0     0       10       20       30
```
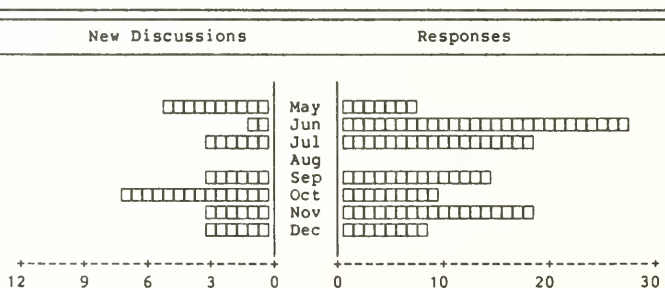
Figure 7

Gained Efficiencies

- [A computer conference] is an inexpensive means of providing ... a common forum or vehicle for discussion. To achieve the same goal through an annual conference, or even a newsletter, would far exceed the costs of supporting a computer conference.

- One of the most attractive features of computer conferencing is the asynchronous nature of the medium. There is no need to schedule a common time for all members to meet, rather, each member participates at his own convenience. This promotes wider participation and completely eliminates the need to arrive at a common timetable to conduct business.

- Comments can be made with more preparation than in a face-to-face meeting, in which it is often impossible to research a topic thoroughly before making comment on unscheduled items.

- Computer conferences maintain a permanent written record of all transactions, eliminating the need for traditional record keeping practices.

- [N]ewsletters are a very slow vehicle for communication.

Figure 8

Democratic Aspects

- [N]o one is excluded from a computer conference for want of travel funds ...

- Newsletters ... seldom reflect the opinions of more than a few people on any specific topic.

- In a computer conference, all participants have an equal opportunity to 'voice' their opinions and to read immediately the replies of others.

- Rarely, in face-to-face meetings, do all present have an opportunity to voice their opinions, for whatever reasons ... In a computer conference no one is excluded from comment. Those who wish to 'say' something have an equal chance to comment.

Figure 9

Compatible Technology

- Data library staff are already 'computer literate'. The computer terminal is a commonplace tool in any data library. Thus, little training or persuasion would be required to introduce participants to the mechanics of conducting the conference.

- Each member can participant from wherever a tele-communications connection can be made, whether it be from an office desk or a kitchen table.

Table 1

Quasi-Experimental Design: Non-Random Assignment,
Posttest-Only Control Groups

GROUP	X = Exp'l Condition O = Observation N = Non-Random Assignment			(N)
1. Invited Before Workshop & Attended	N	X	O	11
2. Invited Before Workshop & Didn't Go	N		O	9
3. Invited After Workshop Held	N		O	9

Table 2

Summary Figure Comparisons of the Average
Monthly Minutes Using DataLink

Summary Statistics	GROUP		
	Workshop	Non-Workshop	Non-Workshop Post-Invite
Avg. Monthly Minutes			
Median	42.5	24.8	16.1
Lower Hinge	11.0	12.8	8.7
LH-UH Midpoint	42.2	21.1	26.4
Upper Hinge	73.4	29.4	44.2
Midspread	62.4	16.6	35.5
N	9	8	6
Avg. Monthly Min. (LOG)			
Median	3.75	3.21	2.71
Lower Hinge	2.40	2.49	2.16
LH-UH Midpoint	3.35	2.94	2.98
Upper Hinge	4.30	3.38	3.79
Midspread	1.90	0.89	1.62
N	9	8	6

Table 3

Multiple Sample Comparisons of the Average
Monthly Minutes Using DataLink

GROUP	N	AVG. RANK	MEDIAN= 25.9		
			N<	N>	N=
Invited & Attended Workshop	9	14.111	3	6	0
Invited & Didn't Go to Workshop	8	10.563	4	3	1
Invited After Workshop Held	6	10.750	4	2	0

TEST	STATISTIC	DF	SIGNIF
KRUSKAL-WALLIS	1.4352	2	.4879
MEDIAN	1.5556	2	.4594

Table 4

The Distribution of DataLink Members by the Number
of Monthly Conference Sessions,
June - December, 1984[*]

Month	Number of Times on the System					No. of Members[¤]
	None	1 - 2	3 - 4	5 - 6	7 or More	
June	12	5	1	0	7	25
July	13	9	0	2	3	27
August	17	6	1	2	2	28
September	18	1	5	0	4	28
October	16	4	2	0	6	28
November	15	5	1	1	6	28
December	15	4	2	2	4	27

[*] The figures for May 1984 were not available.

[¤] Membership changed slightly over the months. There were 20 members at the end of May. One person withdrew and six new members joined in June. Two were added in July and one more started in August. In December, one formally withdrew.

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_____

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INSTITUTION AFFILIATION _____

MAILING ADDRESS _____

_____

_____ ZIP/POSTAL CODE _____

I am requesting:

□ REGULAR MEMBERSHIP . $20.00   MAKE CHECKS PAYABLE
□ STUDENT MEMBERSHIP . $10.00   TO IASSIST
□ INSTITUTIONAL MEMBERSHIP . $35.00

My primary interests are:

□ ARCHIVE SERVICES/ADMINISTRATION
□ DATA PROCESSING/DATA MANAGEMENT
□ RESEARCH APPLICATIONS
□ OTHER (SPECIFY) _____

_____

□ PLEASE INCLUDE MY NAME IN THE IASSIST MEMBERSHIP DIRECTORY

MS. JACKIE MCGEE
THE TREASURER, IASSIST
RAND CORPORATION
1700 MAIN STREET
SANTA MONICA, CA 90406